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13 July, 1998

Suzanne Condon
Massachusetts Department of Public Health
Bureau of Environmental Health Assessment
250 Washington Street, Boston MA 02108-4619

Dear Ms. Condon:

We have completed our analysis of the observations and samples collected in the Saltonstall Building and a final report is enclosed. Attached are tables summarizing the observations, surface, and air sampling data. It is important to remember that these samples constitute worst case conditions, and are not representative of the building as a whole, which was generally free of apparent fungal growth.

I hope these observations are clear and of some help in your continuing efforts to insure a safe and comfortable workplace for the occupants of this building. Let us know if we can be of further assistance.

Sincerely,

Harriet Burge

Harriet A. Burge Ph.D.

FINAL REPORT: SALTONSTALL BUILDING INVESTIGATION

We have completed our analysis of the observations and samples collected in the Saltonstall Building. We spent approximately 2 full days in the building: 1/2 day preliminary walkthrough, 1 and 1/2 days of intensive observation and sample collection. We examined all occupied floors, and included all of the sites listed on the "call-in" complaint sheet. We collected 15 air samples and 53 surface samples, focusing on areas where we observed conditions that could be supporting fungal growth. Thus, samples are not random, but represent a "worst case" sampling approach designed to detect even minimal problems. We collected most samples on the upper floors of the building, and restricted sampling thereafter to particularly suspect sites. This approach was taken because of the relative uniformity of conditions throughout the building.

Overall, while water damage was evident especially around the periphery of the building, there was relatively little evidence of fungal growth and no evidence of unusual airborne exposure to fungi. Most evidence of water damage was on the periphery of the building where many of the columns between windows showed evidence of crumbling plaster, loose/peeling wallpaper, and (occasionally) discoloration. Although this damage was sporadic throughout the building, the west-facing walls appeared to be most affected. On some floors, obvious repairs had been made to columns. None of the columns was currently wet. In addition, carpeting around many of the peripheral induction units was water stained, although none was actually wet at the time of our study. The induction units themselves were relatively clean although the drip pans in several that we dismantled had holes in the drip trays that would allow water to leak directly onto the floor of the units and thence into adjacent carpeting.

A total of 53 surface samples were collected: 13 from water damaged columns, 10 from carpeting, 10 from induction units, 14 from ceiling surfaces, and 6 miscellaneous samples. We also collected 15 air samples representing 135 minutes of air sampling.

The column samples were collected only from selected areas where fungal growth was suspected (i.e., areas of discoloration). None of the sampled columns revealed evidence of currently active fungal growth. About 60% revealed old fungal growth. This is not surprising in view of the "worst case" sampling approach we used. Most of those with such growth were columns with wall paper. It is likely that the wall paper paste provides nutrients that allow more rapid growth than would occur on bare plaster. It may also be that the wallpaper provides a vapor barrier, preventing evaporation of water and extending the time period where conditions are suitable for growth. While a significant proportion of peripheral columns in the building had sustained water damage in the past, most of these columns did not appear to have supported fungal growth. The most likely explanation for this is that the wet columns dried rapidly, especially those without wallpaper. Plaster by itself provides a relatively poor substrate for growth.

We also collected samples from water damaged carpeting. Only 3 of the 10 samples showed any indication of fungal growth, and, of these, only one indicated currently active growth (Sample #36).

Of the 10 induction units sampled, none revealed the presence of active current growth, and only two showed any indication of past growth. In these cases, evidence of past growth was minimal.

No ceiling tile sample revealed any fungal growth. The dark dust that had accumulated on ceiling tiles adjacent to many diffusers was composed primarily of skin scales. This kind of

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accumulation is unlikely to cause health-related problems, although it is unsightly and generates concern among building occupants.

No air sample showed any indication of unusual fungal exposure. One sample indicated local release of fiberglass (Sample # 2). Fibers recovered were the relatively large diameter type associated with fiberglass insulation material. Fiberglass was only rarely or not seen on other air samples, and this appears to be a localized problem.

Finally, we observed evidence of rodent infestation in a number of areas of the building, and actually saw one mouse during our investigation. Rodent urine and dander can be allergenic, and, when it accumulates in the induction units, has a ready pathway into the occupied space.

Recommendations for immediate action:

1. The cause for the fiberglass in the one air sample should be found and corrected, and surfaces in the immediate vicinity (i.e., a radius of about 10 feet) should be wiped with a damp cloth.
2. Because fungal growth appears limited and old, and because there is no evidence of airborne exposure, further remediation can wait until the general remediation effort that will occur following the planned relocation of building occupants.

Once building occupants have been relocated, the following general remediation steps are recommended:

1. Every effort should be made to block further entry of water into the building. In areas where this cannot be accomplished, wallpaper should not be used on the columns, and existing wallpaper should be removed. Carpeting should not be used anywhere that water intrusion is inevitable.

2. Existing old fungal growth should be removed by first vacuuming surfaces using vacuum bags that capture 1μm particles. Wall paper should then be removed, and plaster surfaces cleaned with a good cleaning solution, wiped dry, and replastered where necessary.

3. Stained carpeting should be thoroughly cleaned and dried, or removed. Where water intrusion/spills are likely smooth flooring should be used.

4. Ceiling tiles should be vacuumed to remove visible dirt and adjacent diffusers cleaned. Wet-stained ceiling tiles should be replaced.

5. All induction units should be checked for evidence of damage to the drip trays (i.e., holes, bends, tilted trays). Surfaces within the units (including insulation surfaces) should be vacuumed free of loose dirt.

6. The rodent infestation problem should be solved, especially with respect to rodent access to induction units and the occupied space.

Following re-occupancy a continuing maintenance program should be implemented that includes the following:

1. Water leaks should be addressed within 24 hours, their cause sought and corrected, and water removed within 48 hours.

2. Ceiling tiles that stay consistently wet for more than 1 week should be replaced.

3. Induction units should be periodically inspected, and surfaces maintained free of excess dust accumulation.

4. A systematic rodent control program should be maintained

Location	General Comments	Samples	Specific comments re: samples
22nd floor		*Air sample 1: Desk, receptionist's left*	
NW	Two wet/stained ceiling tiles	*Air sample 2: Training area, Pat's corner*	
	Black deposits on a few diffusers	*Air sample 3: W. Kelley Office on desk*	
	[Test where leaks from roof occur:]	*Air sample 4: DOC, receptionist's desk*	
	[DOC, Peter Macchi 727-3300x214]	1: Induction unit (coils)	
		2: Induction unit (diffuser)	
		3: Ceiling diffuser	
		4: Ceiling diffuser	
		5: Ceiling diffuser	
22nd floor		6: Baseboard near wet carpet: reception area	
SE		7: Carpet, department of corrections	
		8: Diffuser near conference room	
		Air sample 5: Commissioner's area	
		9: Carpet, Commissioner's area	Carpet badly stained; ;
		10: Baseboard: Commissioner's area	water marks on column
		11. Ceiling tile	Ceiling wet opposite Carnevale's Office
		12. Carpet - near water cooler	Water cooler flood
		Air sample 8: near water spill outside 2227	
		Air sample 6: near refrigerator	
		13. Surface dust, opposite Ferron's office	Reasonable accumulation of settled dust
		14. Surface dust on induction unit: 2245	
		15. Ceiling diffuser, copy room	
21st floor	Column near diffuser re-plastered;	*Air sample 9: near Denice Vega, 2105*	
HSB	Split vinyl paper on one column	*Air sample 10: NW corner, below "dirty" diffuser*	
	2109: Repaired column	*Air sample 11: 2109, corner cubicle*	
	2100: water damaged column;	16. Ceiling diffuser, 2105	
	water cooler leak, some floor staining;	17. Ceiling diffuser, air sampling area	2106: Some black on ceiling diffusers
	[Comm. Criminal Justice: 2100, test carpet	18. Carpet 2105, Near induction unit	carpet stained
	J. Rodriguez, 727-6300x333]	19. Dust from induction unit louver	
	[Gov Highway Safetyroom 2105 carpet,	20. Ceiling tile: 2100, corner office	very wet ceiling tile
	Denise Vega, 727-5073x114]		
20th floor		21. Induction unit dust	
EA		22. Behind baseboard	
		23. Induction unit	Black dirt on induction diffuser
		24. Diffuser black dust (Cons. Aff.)	Black dust on all ceiling diffusers; moldy odors
		Air sample 12: DEA, South side of building	
		Air sample 13: Consumer Affairs, near dirty diffuser	
19th floor	Some odor	25. Induction unit: black dust	
	[Env. Management; right rear;	26. Ceiling diffuser dust (DEM)	

	Bill Dunham 727-3180x606]	27. Ceiling diffuser dust, Denham's office	
18th floor	Ceiling very clean. Looks new.		
	No obvious signs of water damage.		
17th floor	No apparent microbial problems (Bill Tourigny)	*Air sample 14: Gay Eng's office*	
	No air coming out of diffusers;	28. Carpet, Gay Eng's area	
	diffusers completely covered;.	29. Induction unit diffuser, Philbrick area	
	Peeling paint on the wall	30. Ceiling support metal in Tourigny area	
	[Workstation & Carpet: J Rawski 727-4130x640]	31. Rusty carpet, Nina Gosnell area	
	[Behind desk: Tourigny 727-7130]	32. Vinyl covering on column, Harvey area	
	[Carpet; Gay Eng, 727-7130]	33. Column, Harvey area	
	[Carpet; Pomeroy]	34. Induction unit, Minervini area	
	[Carpet; Gosneell, 727-7130x373]	*Air sample 15: Ron Minervini office*	
	[Induction unit, Harvey]	35. Column behind vinyl, Pomeroy area	
	[Ducts in restroom; Rudiger, 727-7824x608		
16th floor	Loose vinyl on column;	36. Carpet, Cheryl White area	Drapeau: water stains on wall
	Tape to keep mice in the wall	37. Induction diffuser dust (HRD)	
	[Hearing room, 1604: Centomini, 727-3505x306]	38. Ceiling tile	
	[D. Drapeau's office]	39. Carpet backing	
	[Rm 1611, 2 cubicles; Cheryl White, 727-4015]	42. Column, 1604	
	[Carpet water damage: McCabe, 727-3437x103]		Labor relations hearing room: black discoloration
15th floor	Dust accumulation on induction unit	40. Carpet, Clarity (outside Comm).	Stained Carpet, loose wallpaper
	[Cloherty, Commissioner's, Ledgerwood,	41. Column, behind vinyl; Stanton	HRD: Column damage, south side.
	Bevelaqua, Stanton, Asinoff offices]		
14th floor	Same problems as other floors		
	[Rm 1405, columns, J. Soper 727-1552]		
13th floor	Same problems as other floors		
	[1302: Travel & Tourism; D. Salemy, 727-8380]		
	[1304: Carpet, Reade 305-3733		
	[1305: International Trade, D. Salemy, 727-8380]		
12th floor	Ceiling tiles dirty	43. Column, 1208	Black discoloration on vinyl
	1203: Floor up, exposing wiring chase:	44. Column, 1208	Black discoloration on vinyl
	abundant mouse droppings	45. Column 1209, Telecom	Brown discoloration on vinyl
		46. Top of induction unit, 1201	
		47. Venetian blind dust	
11th floor	Obvious past water damage; repairs apparent		
	Filters on induction unit outlets		
10th floor	Same problems as other floors		
	[Water cooler in kitchen: D. Arinella 727-3100x105]		
9th floor	**[Rm 904, Chris Connolly's office**	48. Carpet near water cooler	

	[Rm 905, Hearing Room]	49. LLRWM, Column were baseboard was	Hearing room: Bubbled plaster
		50. Column in hearing room: CSC	
7th floor	Renovated one year ago	51. Vinyl paper from column	
		52. Dust from surface of induction unit	
		53. Volumn vinyl, computer training area	
3rd floor	DLS: wet ceiling tiles in middle of room apparently related to 4th floor AHU		
1st floor	Very leaky ceiling		
	[100B, Elect rm. Charlie Wolf, 727-1488]		
	Note: Bold type entries refer to specific complaints received before the investigation		

Sample #	site description	fungi	
	22 floor: ABC		
1	Induction unit, coils		
2	Induction unit, diffuser		Notes:
3	Diffuser 1		Normal accumulations of settled
4	Diffuser 2		fungal spores are not indicated in the table
5	Diffuser 3		
	22nd floor: DOC		
6	Baseboard near wet carpet, reception		
7	Carpet		
8	Diffuser near conference room		
9	Carpet, Commissioner's area		
10	Baseboard, Commissioner's area		
11	Ceiling tile, opposite Carnevale office		
12	Carpet: water cooler flood		
13	Surface dust, opposite Ferron's office		
14	Surface dust on Induction unit 2245		
15	Ceiling diffuser, copy room		
	21st floor: Hwy safety bureau		
16	Ceiling diffuser 2105		
17	Ceiling diffuser, air sample area		
18	Carpet 2105, near induction unit		
?	Column near diffuser; replastered		
19	Dust from induction unit louver		
20	Ceiling tile (very wet, 2100		
21	Induction unit dust		
22	Baseboard		
23	Induction unit		
	21st floor: Consumer affairs		
24	Diffuser		
	19 floor:		
25	Induction unit black dust	Several small clumps of *Cladosporium sphaerospermum*	
26	Ceiling dirt		
27	Ceiling dirt, Denham's office		
	18th floor:		
	17th floor:		
28	Carpet: Gay Eng		
29	Induction near A. Philbrick		
30	Ceiling support metal in Tourigny area		
31	Rusty carpet: Nina Gosnell		
32	King Harvey: vinyl cover on column		
33	King Harvey: column	Some evidence of very old growth of either *Penicillium* or *Aspergillus*	
34	Induction unit drip pan (Minervini)		
35	Column behind vinyl Pomeroy		
	16th floor:		
36	Carpet nr induction unit	*Tritirachium* growing and sporuling on some carpet fibers	
37	Induction dust (peripheral)	Several small clumps of Cladosporium sphaerospermum	
38	Ceiling tile dirt		
39	Carpet backing	Evidence of past growth of *Aspergillus;* species determination not possible	
42	Column labor relations 16th floor	Evidence of past growth of *Memnoniella*	
	15th floor		
40	Carpet		
41	Column behind vinyl		
	14th floor: no samples		
	13th floor: no samples		
	12th floor		
43	Column, 1208, black on vinyl	Evidence of past growth of *Memnoniella*	
44	Column 1208, black on vinyl	Evidence of past growth of *Aspergillus*	
45	Column 1209, brown on vinyl	Evidence of past growth of *Aspergillus*	
46	Top of induction unit		
47	Venetian blind dust 1201		
	11th floor: no samples		
	10th floor: no samples		
	9th floor:		
48	Carpet nr. water cooler	One small clump of *Alternaria alternata*	
49	LLRWM, column where baseboard was		
50	Column in hearing room CSC	Evidence of past (old) growth of *Penicillium or Aspergillus*	
	8th floor: no samples		
	7th floor:		
51	DOR: Vinyl paper from column	Fruiting bodies and spores of *Chaetomium globosum*	
	6th floor:		
52	Dust from surface of induction unit		
53	Computer training, column vinyl	Fruiting bodies and spores of *Chaetomium globosum*	
	3rd floor: no samples		
	1st floor: no samples		

Air samples

Sample #	site description	fungi	fiberglass	fungi/m3	fiberglass/m3
	22nd floor				
1	desk, to receptionists left, JV2	2		15	0
2	**Training area (Pat's corner) on desk**	**7**	**21**	**52**	**156**
3	W. Kelley office, on desk	3		22	0
4	DOC, receptionists desk	4	2	30	15
5	Commissioners area, coffee table	12		89	0
6	North side, near refrigerator	3		22	0
8	SE corner near water spill outside 2227	2	1	15	7
	21st floor			0	0
9	2105, near Denice Vega	1		7	0
10	NW corner, cubicle below dirty diffuser)	3	1	22	7
11	Rm 2109, N side, corner cubicle	6		44	0
	20th floor			0	0
12	Dept Environ affairs, south side	4		30	0
13	Consumer affairs, West side	1		7	0
	17th floor			0	0
14	Office of Greg partition	10		74	0
15	Ron Minervini, private office	1		7	0